

REMARKS

The Official Action dated August 15, 2005, has been carefully considered.

Accordingly, the changes and remarks presented herewith are believed sufficient to place the present invention in condition for allowance. Reconsideration is respectfully requested.

By the present Amendment, Claims 1, 3-4, 6-7, 9-14, 16-17, 19-22, 24-25, 27-28, 30-35, 37-38, and 40-42 have been amended and claims 2, 5, 8, 15, 23, 26, 29, 36 and 43 have been cancelled. Claims 44-49 have been added. Support for the claims 44-49 may be found in original claims 1, 2, 8, 15, 22, 23, 29 and 36. Since these changes do not involve any introduction of new matter, entry is believed to be in order and is respectfully requested.

In the Official Action, the Examiner objected to claims 16-21 and 37-43 under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. Claims 16-21 and 37-42 have been amended to be in correct multiple dependent claim form. Whereby, the objection has been overcome. Reconsideration is respectfully requested.

In the Official Action, the Examiner rejected claims 1, 21, 22 and 42 under 35 U.S.C. § 102(b) as being anticipated by Merrill (U.S. Patent No. 6,299,270). The Examiner asserted that Merrill teaches an apparatus including a printhead for an inkjet printer, the printhead comprising: an ink reservoir; nozzles for ejecting ink from the ink reservoir onto print media, the nozzles being formed in the ink jet printhead in a predetermined fashion with bores purposefully shaped and/or directed to determine the formation and placement of satellite droplets when ink is ejected from the ink reservoir when the printhead is part of an inkjet printer. The Examiner asserted that Merrill teaches an apparatus where the nozzle bores are cut with an excimer laser. The Examiner further asserted that Merrill teaches a method of controlling the formation and placement of satellite droplets ejected from an ink jet printer printhead comprising the steps of: providing an ink jet printer printhead having an ink reservoir; forming nozzles in the ink jet printer printhead; installing the printhead in an ink jet

printer; ejecting ink from the reservoir through the nozzles in the form of main drops and satellite droplets in a manner to achieve uniform density control by controlling the formation and placement of satellite droplets when ink is ejected from the reservoir of the ink jet printer printhead when the printhead is part of an ink jet printer.

However, as will be set forth in detail below, it is submitted that the apparatus and methods set forth by claims 1, 21, 22 and 42 are not anticipated by Merrill. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

As defined by presently amended claim 1, the present invention is directed to an apparatus which includes a printhead for an inkjet printer. The printhead comprises an ink reservoir; nozzles for ejecting ink from the ink reservoir onto print media, the nozzles being formed in the ink jet printer printhead in a predetermined fashion with bores purposefully shaped and/or directed to determine the formation and placement of satellite droplets when ink is ejected from the ink reservoir when the printhead is part of an inkjet printer; wherein: (a) each of the nozzles produces a main drop and a satellite droplet when ink is ejected through the nozzles, (b) each nozzle includes a bore, (c) each bore has an axis, (d) a first plurality of the nozzles have the axes of their bores aligned in a first direction, (e) when ink is ejected through the nozzles, each of the satellite droplets ejected through the first plurality of the nozzles is offset from the main drop ejected through the first plurality of the nozzles in substantially the same direction and at substantially the same distance.

As conceded by the Examiner on Page 6 of the Official Action, dated August 15, 2005, "Merrill fails to teach ink ejected through the nozzles, each of the satellite droplets ejected through the first plurality of nozzles is offset from the main drop ejected through the first plurality of the nozzles in substantially the same direction and at substantially the same distance."

To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 U.S.P.Q.2d 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Further, the reference must describe the Applicant's claimed invention sufficiently to place a person of ordinary skill in the field of the invention in possession of it. *Akzo N.V. v. United States Int'l Trade Comm'n*, 808 F.2d 1471, 1479, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986), *cert denied*, 482 U.S. 909 (1987); *In re Coker*, 463 F.2d 1344, 1348, 175 U.S.P.Q. 26, 29 (CCPA 1972).

Among other reasons, as every element and limitation of claims 1, 21, 22 and 44, as arranged therein, cannot be found in Merrill, Merrill does not anticipate the presently claimed invention. Whereby, the rejection has been overcome and reconsideration is respectfully requested.

Claims 2, 3, 5, 6, 7, 12, 13, 23, 24, 26, 27, 28, 33 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill in view of Oikawa (U.S. Patent No. 6,126,282). The Examiner asserted that the device of Merrill teaches an apparatus and method wherein: each of the nozzles produces a main drop and a satellite droplet when ink is ejected through the nozzles, and each nozzle includes a bore. The Examiner conceded that Merrill fails to teach a printhead used in a printer which prints in two directions, and the bore of each nozzle is shaped such that, when ink is ejected through the nozzles, satellite droplets and main drops are balanced - the combination area of satellite droplet and main drop in a first printing direction is as nearly equal as possible to the combined area of the satellite droplet and main drop in a second printing direction opposite to the first printing direction. The Examiner asserted that Oikawa teaches a printhead used in a printer which prints in two directions and the bore of each nozzle is shaped such that, when ink is ejected through the

nozzles, satellite droplets and main drops are balanced - the combination area of satellite droplet and main drop in a first printing direction is as nearly equal as possible to the combined area of the satellite droplet and main drop in a second printing direction opposite to the first printing direction. The Examiner asserted it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Merrill to include a printer that prints bi-directionally and the satellite drops and main drops are balanced in both directions of printing as taught by Oikawa.

However, as will be set forth in detail below, it is submitted that the apparatuses and methods defined by claims 2, 3, 5, 6, 7, 12, 13, 23, 24, 26, 27, 28, 33, 34 are non-obvious and patentably distinguishable from Merrill in view of Oikawa. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

To establish *prima facie* obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981; 180 U.S.P.Q. 580 (CCPA 1974). Moreover, in order for references to be relied upon to support a rejection under 35 U.S.C. § 103 they must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *Glaxo Inc. v. Novopharm Ltd.*, 34 U.S.P.Q.2d, 1565 (Fed. Cir. 1995); *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Merrill in view of Oikawa fail to satisfy these requirements.

The Examiner cites Oikawa as teaching satellite droplets and main drops as being balanced - the combination area of satellite droplet and main drop in a first printing direction is as nearly equal as possible to the combined area of the satellite droplet and main drop in a second printing direction opposite to the first printing direction. The Examiner references Column 6, lines 41-49 which refers to Figures 1A, 1B, 2A and 2B. However, upon closer examination, the combined areas of the satellite droplet and main drop in a first printing direction (Fig. 1A) are not equal to the combined area of the satellite droplet and main drop in

a second printing direction (Fig. 1B). Moreover, Oikawa requires the use of a processing liquid. The processing liquid reacts with the color element in ink and makes it either insoluble or coagulated, with a view to improving the water-resisting property and image quality thereof. The present invention does not require utilization of processing liquid.

Applicants find no teaching or suggestion by Merrill in view of Oikawa of satellite droplets and main drops as being balanced - the combination area of satellite droplet and main drop in a first printing direction is as nearly equal as possible to the combined area of the satellite droplet and main drop in a second printing direction opposite to the first printing direction. It is therefore submitted that the presently claimed apparatuses and methods are nonobvious over and patentably distinguishable from Merrill in view of Oikawa, whereby the rejection under 35 U.S.C. §103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 4, 11, 14, 17, 18, 25, 32, 35, 38 and 39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill in view of Weber et al (U.S. Patent No. 6,155,670). The Examiner asserted that Merrill teaches a nozzle producing a main drop and a satellite droplet when ink is ejected through the nozzles, each nozzle includes a bore and each bore has an axis. The Examiner conceded that Merrill fails to teach a first plurality of nozzles having the axes of their bores aligned in a first direction, a second plurality of nozzles having the axes of their bores aligned in a second direction, and when ink is ejected through the nozzles, satellite droplets ejected through the first plurality of the nozzles are offset from the main drops ejected through the first plurality of the nozzles in a different direction from which satellite droplets ejected through the second plurality of nozzles are offset from the main drops ejected through the second plurality of the nozzles. The Examiner asserted that Weber et al. teach a first plurality of nozzles having the axes of their bores aligned in a first direction, a second plurality of nozzles having the axes of their

bores aligned in a second direction, and when the ink is ejected through the nozzles, satellite droplets ejected through the first plurality of the nozzles are offset from the main drops ejected through the first plurality of the nozzles in a different direction from which satellite droplets ejected through the second plurality of the nozzles are offset from the main drops ejected through the second plurality of the nozzles. The Examiner asserted it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Merrill to include a first row of nozzles aligned in a first direction and a second row of nozzles aligned in a second direction as taught by Weber et al.

However, as will be set forth in detail below, it is submitted that the apparatuses and methods defined by claims 4, 11, 14, 17, 18, 25, 32, 35, 38 and 39 are non-obvious and patentably distinguishable from Merrill in view of Weber et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

As noted above, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka, supra*. Moreover, in order for references to be relied upon to support a rejection under 35 U.S.C. § 103 they must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *Glaxo Inc. v. Novopharm Ltd., supra*; *In re Payne, supra*. Merrill in view of Weber et al. fail to satisfy these requirements.

The teachings of Merrill are discussed above. Weber et al. disclose an inkjet printhead which has an array of drop generators employed to eject ink to form dots on a print medium. A plurality of ink ejecting nozzles is associated with one drop generator of the array of drop generators such that each nozzle of the plurality of ink ejecting nozzles ejects an ink droplet essentially simultaneously when the one drop generator is activated. The plurality of ink ejecting nozzles is arranged to eject a droplet during the first activation of the one drop

generator and place a majority of dots on the print medium outside a target pixel disposed opposite the one drop generator.

The deficiencies of Merrill are not overcome with the combination of Weber et al. Moreover, Weber et al. alone or in combination with Merrill, fail to teach or suggest a printhead having a first and second plurality of nozzles with the axes of their bores aligned in a first and second direction respectively, and wherein when ink is ejected through the nozzles, satellite droplets ejected through the first plurality of the nozzles are offset from the main drops ejected through the first plurality of the nozzles in a different direction from which satellite droplets ejected through the second plurality of the nozzles are offset from the main drops ejected through the second plurality of the nozzles. Moreover, Weber et al. fail to disclose or suggest satellite droplets being formed. Rather, Weber et al. disclose a plurality of nozzles associated with a single drop generator and simultaneously ejecting ink from each of the ink ejecting nozzles when one drop generator is activated.

It is therefore submitted that the presently claimed methods and apparatuses are nonobvious over and patentably distinguishable from Merrill in view of Weber et al., whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 19 and 40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill in view of Yaegashi et al. (U.S. Patent No. 6,079,809). The Examiner conceded that Merrill fails to teach a printhead having large and small nozzles. The Examiner asserted that Yaegashi et al. teach a printhead having large and small nozzles. The Examiner asserted it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Merrill to incorporate large and small nozzles as taught by Yaegashi et al.

However, as will be set forth in detail below, it is submitted that the apparatuses and methods defined by claims 19 and 40 are non-obvious and patentably distinguishable from Merrill in view of Yaegashi et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The deficiencies of Merrill are not overcome with the combination of Yaegashi et al. Moreover, Yaegashi et al. alone or in combination with Merrill, fail to teach or suggest a printhead having a first plurality of nozzles with the axes of their bores aligned in a first direction, and when ink is ejected through the nozzles, each of the satellite droplets ejected through the first plurality of the nozzles is offset from the main drop ejected through the first plurality of the nozzles substantially the same direction and at substantially the same distance.

As noted above, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka, supra*. Moreover, in order for references to be relied upon to support a rejection under 35 U.S.C. § 103 they must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *Glaxo Inc. v. Novopharm Ltd., supra*; *In re Payne, supra*. Merrill in view of Yaegashi et al. fail to satisfy these requirements.

Applicants find no teaching or suggestion by Merrill in view of Yaegashi et al. of a printhead having a first plurality of nozzles with the axes of their bores aligned in a first direction, and when ink is ejected through the nozzles, each of the satellite droplets ejected through the first plurality of the nozzles is offset from the main drop ejected through the first plurality of the nozzles substantially the same direction and at substantially the same distance. It is therefore submitted that the presently claimed apparatuses and methods are nonobvious over and patentably distinguishable from Merrill in view of

Yaegashi et al., whereby the rejection under 35 U.S.C. §103 has been overcome.

Reconsideration is respectfully requested.

In the Official Action, claims 20 and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill in view of Inoue et al. (U.S. Patent No. 5,594,479). The Examiner conceded that Merrill fails to teach a printhead having nozzle bores formed in a polyimide film. The Examiner asserted that Inoue et al. teach nozzle bores formed in a polyamide film. The Examiner asserted it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Merrill to have nozzle bores formed of a polyamide film as taught by Inoue et al.

However, as will be set forth in detail below, it is submitted that the apparatuses and methods defined by claims 20 and 41 are non-obvious and patentably distinguishable from Merrill in view of Inoue et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

The deficiencies of Merrill are not overcome with the combination of Inoue et al. Moreover, Inoue et al. alone or in combination with Merrill, fail to teach or suggest a printhead having a first plurality of nozzles with the axes of their bores aligned in a first direction, and when ink is ejected through the nozzles, each of the satellite droplets ejected through the first plurality of the nozzles is offset from the main drop ejected through the first plurality of the nozzles substantially the same direction and at substantially the same distance.

As noted above, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka, supra*. Moreover, in order for references to be relied upon to support a rejection under 35 U.S.C. § 103 they must provide an enabling disclosure, i.e., they must place the claimed invention in the

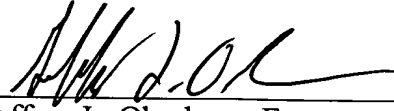
possession of the public. *Glaxo Inc. v. Novopharm Ltd., supra; In re Payne, supra.* Merrill in view of Inoue et al. fail to satisfy these requirements.

Applicants find no teaching or suggestion by Merrill in view of Inoue et al. of a printhead having a first plurality of nozzles with the axes of their bores aligned in a first direction, and when ink is ejected through the nozzles, each of the satellite droplets ejected through the first plurality first plurality of the nozzles is offset from the main drop ejected through the first plurality of the nozzles substantially the same direction and at substantially the same distance. It is therefore submitted that the presently claimed apparatuses and methods are nonobvious over and patentably distinguishable from Merrill in view of Inoue et al., whereby the rejection under 35 U.S.C. §103 has been overcome. Reconsideration is respectfully requested.

Finally, Applicant appreciates the Examiner indication of allowable subject matter in claims 8-10, 15, 29-31 and 36. Newly added claims 44-45 incorporate the limitations of claims 8, 15, as well as original independent claim 1 and any intervening claim. Newly added claims 46-47 incorporate the limitations of claims 29 and 36, as well as original independent claim 22 and any intervening claim. As such, it is believed that claims 44-47, and any claims dependent thereon, as presently amended are allowable.

It is believed that the above represents a complete response to the Examiner's objections and rejections under 35 U.S.C. §§ 102, 103, and places the present application in condition for allowance. Reconsideration and an early allowance are requested.

Respectfully submitted,



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